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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/774,766	02/06/2004	Jack Y. Peng	27140.013	8821
21907	7590	07/24/2006	EXAMINER	
ROZSA LAW GROUP LC 18757 BURBANK BOULEVARD SUITE 220 TARZANA, CA 91356-3346			MAI, NGOCLAN THI	
			ART UNIT	PAPER NUMBER
			1742	

DATE MAILED: 07/24/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

<b>Office Action Summary</b>	<b>Application No.</b> 10/774,766	<b>Applicant(s)</b> PENG ET AL.	
	<b>Examiner</b> Ngoclan T. Mai	<b>Art Unit</b> 1742	

**-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --**

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on RCE filed 28 April 2006.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-9 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-9 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)  | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                                   | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____  |

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### **DETAILED ACTION**

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 4/28/06 has been entered.
2. Claims 1-9 are pending. Claim 1 is amended.
3. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

### ***Claim Rejections - 35 USC § 112***

4. The following is a quotation of the second paragraph of 35 U.S.C. 112:  
  
The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.
5. Claims 5, 8, and 9 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

claims 5 and 9 are indefinite because, in the preamble they recite "said modulus ceramic particles in accordance of claim 4" which is not clear whether applicant intend to claim the modulus ceramic particles per se or the nanocomposite in accordance of claim 4, wherein said modulus ceramic particles comprises the limitations as set forth in the claims.

Similarly, claim 8 is indefinite because, in the preamble it recites "said nano-scale aluminum oxide in accordance of claim 3" which is not clear whether nano-scale aluminum oxide particles per se is being claimed or the composite that containing the nano-scale aluminum oxide particles.

### ***Claim Rejections - 35 USC § 102***

6. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

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A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

7. Claims 1-5, 7-9 are rejected under 35 U.S.C. 102(e) as being anticipated by Meeks, III et al. (U.S. Patent No. 6,630,008, now “Meeks”).

Meeks disclosed nanocrystalline aluminum metal matrix composites comprising aluminum metal matrix, nano-scale oxide phase and a modulus phase. The nanocrystalline aluminum metal matrix composites are formed by coating SiC particles with aluminum metal to encapsulate each individual SiC particle with aluminum metal, developing a passive oxide layer on the coated particles, which eventually serves as an in-situ dispersion-strengthening constituents and then consolidating the aluminum coated SiC particles having passive oxide layer thereon to provide a consolidated powder metal object, claims 1-3, col. 5, lines 1-17. Meeks taught forming the nano-scale oxide phase by during consolidation by a forging technique where the tenacious oxide coating inherently on the aluminum powder particle is first “broken up” by the dynamic shear stresses within the die cavity allowing clean metal powder surfaces to bond, and then the oxide is actually dispersed throughout the aluminum metal matrix and acts as a secondary strengthen element by pinning aluminum grain boundary and retarding grain growth of the aluminum, col. 7, lines 4-12. Note that by allowing certain thickness of oxide layer to form on the aluminum metal, the amount of aluminum oxide is controlled. Also note that by braking up the oxide coating from the aluminum powder particle, aluminum phase is formed.

As for claim 5, regarding the type of modulus ceramic particle, Meeks disclosed boron carbide, silicon carbide and titanium carbide, col. 7, lines 43-47.

As for claim 7, regarding the amount of modulus ceramic particles, Meeks taught SiC in the amounts of 25 v/o and 35 v/o, col. 2, lines 22-25.

As for claim 8, regarding the size of the aluminum oxide, Meeks taught the oxide layer is 10-15 nm in thickness, col. 5, lines 9-11. (Note that the reference indicates the thickness in mm. This appears to be

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an error and should have nanometer as the unit because the thickness of the oxide layer on a 16-21 micron particle (10-15 micron diameter + 2-3 micron aluminum coating) cannot be higher than the size of the particles). The aluminum oxide when broken up by the shear stress would therefore inherently be in nanometer size.

As for claim 9, regarding the average particle size of the modulus ceramic particle, Meeks taught employing particle having particle size between 10 and 15 microns, col. 5, lines 2-4.

8. Claims 1-5, 7-8 are rejected under 35 U.S.C. 102(b) as being anticipated by Sawtell et al (Pat 5,561,829).

Sawtell disclosed a structural metal matrix composite comprising a metal powder phase and at least one reinforcement phase. The composite is formed by cold pressing a blend of 50 - 90 vol.% aluminum alloy powder and 10-50 vol.% silicon carbide as the reinforcement material, heating the compact to form a preheated compact and hot working the heated compact. Sawtell also taught aluminum oxide phase by disclosing that during the hot working the hard second component abrades the oxide film on the aluminum alloy which inhibits the particle-to-particle bonding necessary to form structural product, col. 5, lines 38-46, claims 24 and 26 and col. 1, lines 41-57. While Sawtell did not specifically nano-scale aluminum oxide, it is well known in the art that aluminum oxide layer inevitable formed on the aluminum metal particle would form aluminum oxide particles having nano-scale size.

As for claim 2, Sawtell taught the claimed limitation in col. 7, lines 21-24.

As for claim 5, Sawtell disclosed the reinforcement material includes boron carbide and silicon carbide, col. 4, lines 3-9.

### ***Claim Rejections - 35 USC § 103***

9. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and

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the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

10. Claim 6 is rejected under 35 U.S.C. 103(a) as being unpatentable over Meeks, III et al. or Sawtell in view of Bomford et al. (U.S. Patent No. 3,816,080, now "Bomford")

Meeks or Sawtell differs from the claim in that Meeks did not specifically teach the amount of aluminum oxide.

Bomford disclosed aluminum oxides when dispersed in aluminum matrix enhance the strength, stress-rupture life, electrical conductivity and thermal conductivity of the aluminum or aluminum alloy product, col. 3, lines 41-50. Bomford taught up to 10% by weight of aluminum oxide can be included in the aluminum or aluminum alloy product, col. 8, lines 13-19.

Thus it would have been obvious to one of ordinary skill in the art at the time the invention was made that the composites taught by Meeks or Sawtell is made to include nano-scale aluminum oxide in the amount at taught by Bomford to provide an aluminum matrix composite product with improved combinations of strength, stress-rupture life, electrical conductivity and thermal conductivity as taught by Bomford.

11. Claim 9 is rejected under 35 U.S.C. 103(a) as being unpatentable over Sawtell in view of Meeks. Sawtell differs from the claim in that there is no teaching of the average particle size of the modulus ceramic particle.

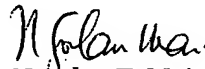
Meeks, in the same field endeavor, disclosed employing modulus ceramic SiC particle having particle size of 10 to 15 microns in aluminum matrix improve the flexure strength and flexure modulus of the composite. Thus it would have been obvious to one of ordinary skill in the art at the time the invention was made to employ SiC having particle size as disclosed by Meeks in the composite of Sawtell to form structural metal matrix composite having improve the flexure strength and flexure modulus.

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12. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Ngoclan T. Mai whose telephone number is (571) 272-1246. The examiner can normally be reached on 9:30-6:00 PM Monday-Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Roy King can be reached on (571) 272-1244. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

  
Ngoclan T. Mai  
Primary Examiner  
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n.m.